

Gradient Calculations

Estimates were developed for the regional gradient of all four sands (A, B, C and D) and the graben gradient for Sand A and Sand B. September 2008 UEC water level measurements were used to develop the estimates. For regional estimates, water levels from surrounding wells (provided by UEC) and water levels from the Texas Department of Licensing and Regulation's (TDLR) water well database were included where the completion sand could be estimated. Water level elevations were gridded using Surfer (Golden Software). Grid calculus options in Surfer were then used to calculate the gradient magnitude and direction for each grid node. These values were averaged to produce mean gradients. In calculation of the mean gradients, grid nodes with gradient directions between 270 and 360 degrees were excluded based on known regional gradient directions. Excluding these grid nodes from the calculation affected only the regional gradient calculations.

The following table describes the wells used for each gradient estimate.

Sand	Mean Gradient	Mean Gradient Direction	Wells Used for Calculations
A (regional)	0.00125	86.39	UEC A-Sand Wells (Sept 2008 Data), Adjacent Wells (provided by UEC, various dates), Wells from the TDLR Database
B (regional)	0.00220	122.01	UEC B-Sand Wells (Sept 2008 Data), Adjacent Wells (provided by UEC, various dates), Wells from the TDLR Database
C (regional)	0.00199	118.78	UEC C-Sand Wells (Sept 2008 Data), Adjacent Wells (provided by UEC, various dates), Wells from the TDLR Database
D (regional)	0.00292	103.55	UEC D-Sand Wells (Sept 2008 Data), Adjacent Wells (provided by UEC, various dates), Wells from the TDLR Database
A (OMW)	0.00061	92.86	UEC OMW Wells (Sept 2008 Data)
B (BMW ed)	0.00061	89.60	UEC BMW Wells, excluding wells determined to be outliers (BMW-7, 9 and 12) (Sept 2008 Data)
A (graben ed)	0.00047	83.40	UEC A-Sand Wells (OMW wells, RBLA wells and PT_AD) within the graben (Sept 2008 Data)

The attached Excel file (Copy of WATER LEVELS - SEPT'08 (2).xls) contains the UEC water levels used for the calculations.

43	PTW-12	72.97	161.1325
44	PTW-13	73.95	160.3801

S.No.	Well #	Water Levels, ft	Water Levels, ft (MSL)
45	CBP-1	78.25	161.18
46	PT-AU	55.35	193.929
47	PT-AD	85.6	159.831
48	PT-BU	75.2	169.667
49	PT-BD	80.37	162.168
50	PT-CU	77.25	167.235
51	PT-CD	78.1	163.754
52	PT-DU	81.64	166.351
53	PT-DD	92.56	150.706
54	WW-2	96.26	143.17
55	RBLA-1	64.75	158.7015
56	RBLA-2	83.54	158.983
57	RBLA-3	80.6	158.9996
58	RBLA-4	N/A	
59	RBLA-5	74.55	158.893
60	RBLB-1	74.4	161.3612
61	RBLB-2	51.65	170.5407
62	RBLB-3	71.71	161.3616
63	RBLB-4	73.1	161.7383
64	RBLB-5	73.55	161.1978
65	RBLC-1	77.88	169.0776
66	RBLC-2	70.65	163.9241
67	RBLC-3	65.1	162.1857
68	RBLC-4	60.8	163.7848
69	RBLC-7	77.15	169.0941
70	RBLD-1	56.15	165.5972
71	RBLD-2	84.8	148.2525
72	RBLD-3A	72.23	147.3022
73	RBLD-5	91.1	148.7382
74	RBLD-6	89.65	166.1632